

**Study Guide**

For use with pages 253–257

**GOAL** Use the LCD to solve equations and inequalities.**EXAMPLE 1** Solving an Equation by Clearing Fractions

$\frac{9}{10}x - \frac{11}{15} = -\frac{12}{25}$	Original equation
$150\left(\frac{9}{10}x - \frac{11}{15}\right) = 150\left(-\frac{12}{25}\right)$	Multiply each side by LCD of fractions.
$150\left(\frac{9}{10}x\right) - 150\left(\frac{11}{15}\right) = 150\left(-\frac{12}{25}\right)$	Use distributive property.
$135x - 110 = -72$	Simplify.
$135x - 110 + 110 = -72 + 110$	Add 110 to each side.
$135x = 38$	Simplify.
$\frac{135x}{135} = \frac{38}{135}$	Divide each side by 135.
$x = \frac{38}{135}$	Simplify.

**EXAMPLE 2** Solving an Equation by Clearing DecimalsSolve the equation  $4.263 = 2 - 0.31x$ .**Solution**Because the greatest number of decimal places in any of the terms with decimals is 3, multiply each side of the equation by  $10^3$ , or 1000.

$4.263 = 2 - 0.31x$	Write original equation.
$1000(4.263) = 1000(2 - 0.31x)$	Multiply each side by 1000.
$4263 = 2000 - 310x$	Use distributive property. Simplify.
$4263 - 2000 = 2000 - 310x - 2000$	Subtract 2000 from each side.
$2263 = -310x$	Simplify.
$\frac{2263}{-310} = \frac{-310x}{-310}$	Divide each side by $-310$ .
$-7.3 = x$	Simplify.

**Exercises for Examples 1 and 2****Solve the equation by first clearing the fractions.**

1. $\frac{4}{30}x + \frac{11}{20} = \frac{7}{12}$	2. $-\frac{26}{45}x + \frac{3}{10} = -\frac{8}{9}$	3. $-\frac{13}{24}x - \frac{11}{12} = \frac{5}{6}$
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**Solve the equation by first clearing the decimals.**

4. $1.2a - 3.65 = -2.57$
5. $-0.18b + 11.2 = 12.856$
6. $9.6m + 10.28 = -37.72$

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**EXAMPLE 3 Solving an Inequality with Fractions**

You have 5 cups of raisins. You need  $\frac{3}{4}$  cup of raisins to make one loaf of raisin bread and 1 cup of raisins to make one dozen oatmeal raisin cookies. You want to make 2 dozen oatmeal raisin cookies. How many loaves of raisin bread can you make?

**Solution**

Write a verbal model. Let  $n$  represent the loaves of raisin bread you can make.

Cups of raisins per dozen	•	Number of dozens of cookies	+	Cups of raisins per loaf	•	Number of loaves of bread	≤	Cups of raisins you have
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$$1 \cdot 2 + \frac{3}{4}n \leq 5$$

Substitute.

$$2 + \frac{3}{4}n \leq 5$$

Simplify.

$$\frac{3}{4}n \leq 3$$

Subtract 2 from each side and simplify.

$$\frac{4}{3}\left(\frac{3}{4}n\right) \leq \frac{4}{3}(3)$$

Multiply each side by the multiplicative inverse of  $\frac{3}{4}$ .

$$n \leq 4$$

Simplify.

**Answer:** You can make at most 4 loaves of raisin bread.

**EXAMPLE 4 Solving an Inequality by Clearing Fractions**

$$-\frac{7}{10}x + \frac{5}{12} > \frac{2}{9}$$

Original inequality

$$180\left(-\frac{7}{10}x + \frac{5}{12}\right) > 180\left(\frac{2}{9}\right)$$

Multiply each side by LCD of fractions.

$$180\left(-\frac{7}{10}x\right) + 180\left(\frac{5}{12}\right) > 180\left(\frac{2}{9}\right)$$

Use distributive property.

$$-126x + 75 > 40$$

Simplify.

$$-126x > -35$$

Subtract 75 from each side and simplify.

$$x < \frac{5}{18}$$

Divide each side by  $-126$ , reverse inequality symbol, and simplify.

**Exercises for Examples 3 and 4**

Solve the inequality.

7.  $\frac{3}{7}x + 2 < 12$

8.  $\frac{7}{11}x - \frac{5}{6} \geq \frac{1}{2}$

9.  $-\frac{11}{24}y + \frac{7}{9} \leq -\frac{3}{16}$